

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A mixture or set of sub-mixtures comprising X-mer precursors **of different length**,

wherein the X-mer precursors have a minimum length of 3 nucleotides;

wherein the mixture has a minimum mixture coverage complexity of at least 56/N or wherein the set of sub-mixtures has a composite mixture coverage complexity of at least 56/N, wherein N represents the number of distinct X-mer precursors in the mixture;

wherein each sub-mixture in said set has a reduced mixture coverage complexity as compared with the composite mixture coverage complexity;

wherein each sub-mixture comprises a plurality of X-mer precursors;

wherein said length is selected independently for each X-mer precursor; and

wherein the mixture or set of sub-mixtures further comprises a set of tags that are distinguishable by mass spectrometry, wherein each tag is covalently linked to at least one X-mer precursor through a cleavable linker such that any given oligonucleotide sequence in the mixture is attached to ~~preferably~~ a single tag with a discrete molecular weight.

2. (Currently amended) A mixture or set of sub-mixtures comprising X-mer precursors **of different length**,

wherein said X-mer precursors have a minimum length of 3 nucleotides;

wherein said mixture has a minimum mixture coverage complexity of at least 56/N or wherein said set of sub-mixtures has a composite mixture coverage complexity of at least 56/N, wherein N represents the number of distinct X-mer precursors in the mixture;

wherein each sub-mixture in said set has a reduced mixture coverage complexity as compared with the composite mixture coverage complexity;

wherein each sub-mixture further comprises a plurality of X-mer precursors;

wherein said length is selected independently for each X-mer precursor;

wherein the mixture or set of sub-mixtures further comprises a set of tags, wherein each tag is covalently linked to at least one X-mer precursor through a

cleavable linker such that any given oligonucleotide sequence in the mixture is attached to preferably a single tag with a discrete molecular weight; and
wherein said X-mer precursors have a determined isotopic composition.

3. (Original) The mixture or set of sub-mixtures of claim 1 or 2 wherein said mixture has a mixture coverage complexity of at least about $1/2$ when said mixture contains at least 128 discrete X-mers, or wherein said set of sub-mixtures has a composite mixture coverage complexity of at least about $1/2$ when said set of sub-mixtures contains at least 128 discrete X-mers.

4. (Original) The mixture or set of sub-mixtures of claim 1 or 2, wherein said mixture has a mixture coverage complexity of at least about $1/4$ when said mixture contains at least 256 discrete X-mers, or wherein said set of sub-mixtures has a composite mixture coverage complexity of at least about $1/4$ when said set of sub-mixtures contains at least 256 discrete X-mers.

5. (Original) The mixture or set of sub-mixtures of claim 1 or 2, wherein said mixture has a mixture coverage complexity of at least about $1/8$ when said mixture contains at least 512 discrete X-mers, or wherein said set of sub-mixtures has a composite mixture coverage complexity of at least about $1/8$ when said set of sub-mixtures contains at least 512 discrete X-mers.

6. (Original) The mixture or set of sub-mixtures of claim 1 or 2, wherein nucleotide sequences of the precursors of said mixture or set of sub-mixtures are known.

7-82. (cancelled)